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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,487	07/20/2001	Willard K. McClintock	26608-1	2572
7590	10/17/2005		EXAMINER	
Todd W Minor P O Box 157 Glencoe, KY 41046			MCNELIS, KATHLEEN A	
			ART UNIT	PAPER NUMBER
			1742	

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/909,487	MCCLINTOCK ET AL.
	Examiner Kathleen A. McNelis	Art Unit 1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 29 August 2005.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1,2,4-7,26 and 30 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1,2,4-7,26 and 30 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_

### **Acknowledgement of RCE**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on Aug 29, 2005 has been entered.

### **Claims Status**

Claims 1-2, 4-7, 26 and 30 remain for examination wherein claims 1, 4-7, 26 and 30 are amended. Claims 3, 8-25, 27-29 and 31-32 were canceled.

### **Status of Previous Rejections**

#### ***Claim Rejections - 35 USC § 112***

The previous rejection of claims 1-7, 26, 27 and 30 under 35 USC § 112 is withdrawn based on applicants' amendments of claims.

#### ***Claim Rejections - 35 USC § 103***

The previous rejection of claims 1 to 7, 26, 27 and 30 under 35 USC § 103 is withdrawn based on applicants' amendment of the claims.

### **DETAILED ACTION**

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-2, 4-7 and 30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

The claim(s) contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The addition of "b) from about 70% to about 95% of a slag foaming material" was not previously disclosed and seems to be inconsistent with information provided in the specification, page 9, lines 12-18, wherein "slag foaming material" can contain up to 30% by weight PCM.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 5, 6 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fudala (U.S. Pat. No. 5,493,580).

Fudala discloses a method for recycling electric arc furnace dust collected during production of steel. Fudala discloses that the dust is “collected in dust filtering devices” (col. 1, lines 15-18), which would include materials collected in a gravity type filtering device such as a “drop out box.” The recycled electric arc furnace dust and coal are injected into an electric arc furnace at the interface between the slag and molten metal bath (col. 2, lines 4-8).

Fudala does not specifically disclose that the dried post combustion material is between 5 and 30% of the injected material or that the slag foaming material is between 70 and 95%.

Fudala discloses that the composition of filter dust in the filter dust/carbon mixture is no more than 70% filter dust (col. 4, lines 22-28). This could be rephrased as the amount of dust is between 0 and 70% and the carbon between 30 and 100%. The range of 0-70% filter dust overlaps with the claimed range of between 5 and 30%. It would have been obvious to one of ordinary skill at the time the invention was made to

use a composition of between 5 and 30% filter dust in the dust/carbon mixture of Fudala, since Fudala teaches that the entire range from between 0 and 70% is beneficial for foaming the slag (col. 2, lines 18-31). The range of between 30 and 100% coal overlaps with the claimed range of between 70 and 95%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use between 70 and 95% coal in the filter dust/coal mixture of Fudala, since Fudala teaches that the entire range from between 30 and 100% is beneficial for foaming the slag (col. 2, lines 18-31).

Fudala discloses that the particles are injected at the interface between the slag and molten metal bath (col. 4, lines 12-21), which means that the material is of a size to allow injection as in instant claim 5.

Fudala discloses that the carbon and fines are approximately the same granulometry, ranging from 0 to 5 mm (col. 4, lines 32-36), which is the same as saying the particles are less than about 3/16 of an inch in size. The range of less than 3/16 of an inch is within the range of less than 5/16 of an inch in instant claim 6.

Fudala teaches that in typical operations between 3 and 30 Kg of filter dust are produced per ton of steel (col. 1, lines 15-34). The amount of filter dust injected back into the furnace for recovery is limited by Fudala to 24 Kg/ton of steel produced (col. 4, lines 1-4), which is the same as saying the recovery of iron from the steel processing material is only a portion of the iron in the heat as in instant claim 30.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fudala (U.S. Pat. No. 5,493,580) in view of Lankford Jr. et al. (The Making, Shaping and Treating of Steel, 1985).

The process disclosed by Fudala includes a foaming slag as described above, but is silent regarding the slag composition and quantity. Fudala therefore does not teach the addition of dolomitic stone as in instant claim 2.

Lankford Jr. et al. teaches that the melt impurities determine the type of flux that will be used (p. 325). For removal of acidic impurities, such as sulfur, a basic slag consisting of either dolomite or limestone may be used. The choice of flux material and quantity are result effective variables, determined by the melt impurities (pp. 325 –326). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use dolomite or limestone as a flux in the process of Fudala to remove acidic impurities as taught by Landford Jr. et al. Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the addition rate of dolomite for limestone flux based on melt impurities to be removed.

Claims 4 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fudala (U.S. Pat. No. 5,493,580) in view of Ford Jr. et al. (U.S. Pat. No. 5,738,694).

Fudala teaches a method for injecting filter dust and coal into an electric arc furnace at the interface between the slag and molten metal as described above.

Fudala does not teach that the dried post combustion material is less than about 2% water as in instant claims 4 and 26.

Ford Jr. et al. discloses a method for agglomerating electric arc furnace dust (col. 3, lines 52-59) with a dolomite lime binder (col. 4, lines 18-32) and coal (col. 3 lines 1-10) prior to use in a steel making process (abstract). Ford Jr. et al. teaches that suitable iron containing material is essentially free of moisture, with a moisture content of 2 wt% or less (col. 3, lines 60-65). Ford Jr. et al. teaches that previous efforts to use coal fines in solid form were unsuccessful due to disintegration of the fines into small particles which were then carried into waste gases as dust. The agglomeration method of Ford Jr. et al. binds the coal fines to the iron material, inhibiting loss of the coal fines as dust in waste gases (col. 3, lines 11-29). It would have been obvious to one of ordinary skill in the art at the time the invention was made to agglomerate the electric arc furnace dust and coal fines of Fudala with a binder as taught by Ford Jr. et al., prior to injection into the electric arc furnace of Fudala to prevent the entrainment of coal fines as dust in waste gas as taught by Ford Jr. et al.

The amount of filter dust is limited to a maximum of 24 Kg of filter dust injected per ton of steel (or 2.4%) as described above regarding instant claim 30. The range of less than or equal to 2.4% overlaps with the claimed range of less than 1% by weight (instant claim 26). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add filter dust to be less than 1% of the melt, since Fudala teaches that any amount up to a maximum of 2.4% may be added (col. 4, lines 1-4).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fudala (U.S. Pat. No. 5,493,580) in view of Steger et al. ("Waste Gas Purification and Waste Free Plant Concept for EAF", 1999).

Fudala discloses a process wherein that dust is recycled to an electric arc furnace as described above.

Fudala is silent with respect to the iron content of the electric arc furnace dust and therefore does not disclose that the post combustion material comprises about 30% to about 55% Fe as in instant claim 5.

When prior art seems to be identical, except that the prior art is silent as to an inherent characteristic, a further reference may be used to provide intrinsic evidence (MPEP Section 2112). Steger et al. teach that the amount of iron oxide present in EAF dusts varies depending on the type of operation generating the dust (e.g. AC, DC or scrap-preheating FSF type electric arc furnace). Figure 4 shows approximately 50% iron oxide generated from DC type electric arc furnace down to approximately 12% from a FSF furnace. Since  $Fe_2O_3$  is 70-wt% iron, this indicates a range of metallic iron content from 8 to 35%. The range of between 8 to 35 % overlaps with between 30 and 55% in instant claim 5. Steger et al. teaches that it is an inherent property of the electric arc furnace dusts that the composition of iron is between 8 and 35%. Since the feed material to the process of Fudala is electric arc furnace dusts, these dusts would also have the inherent iron composition of between 8 and 35%.

### **Response to Arguments**

Applicant's arguments with respect to claims 1-2, 4-7, 26 and 30 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen A. McNelis whose telephone number is 571-272-3554. The examiner can normally be reached on M-F 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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